

APION LONGIROSTRE OLIVIER OCCURS ON COTTON IN THE UNITED STATES (COLEOPTERA: CURCULIONIDAE)

By D. G. KISSINGER¹

The distribution in North America of *Apion longirostre* Olivier, the "hollyhock weevil," has recently been treated by Warner (1964, *Coleop. Bull.* 18:17). There it was pointed out that the species is associated with cotton in Turkey. Recently a specimen was sent to the author for identification labeled, "Clay Co., Arkansas, 21 August 1964, D. Barnes, on cotton square." The species now occurs in the United States much further west than indicated by Warner; material has been seen from Denver, Colorado. W. E. Simonds, of the California Department of Agriculture, (in litt.) indicates the species has been found in the following California counties: Amador, El Dorado, Napa, Placer, Plumas, Sierra, Siskiyou, Sonoma, and Tuolumne.

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NOTES ON THE BUPRESTIDAE (COLEOPTERA): PART V WITH DESCRIPTIONS OF PREVIOUSLY UNKNOWN SEXES

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This paper includes new distributional and biological information as well as descriptions of Buprestids previously known from only one sex. Thanks are due the late Dr. Harold Grant, Jr. for allowing the writer to examine types in the Academy of Natural Sciences of Philadelphia, to Mr. George Vogt for making comparisons with types in the U. S. National Museum and to Mr. D. S. Verity for allowing the writer to mention records from his collection.

Polycesta haageni Barr, 1949, *American Mus. Novitates*, No. 1432, pp. 30-32, fig. 9. This species is recorded from Kern and Inyo Cos., CALIF., One male and one female were cut from *Chrysothamnus nauseosus* (Pall.) Britt. by D. S. Verity at Summit Valley, San Bernardino Co., CALIF., May 30, 1965.

Acmaeodera adenostomensis Knull, 1941, *Ann. Ent. Soc. America* 34:691-692, fig. 4. Two specimens of this species were collected by E. L. Sleeper 4-10 mi. S. of San Matias Pass, Baja Calif. N., MEX. (first record for the state).

Acmaeodera alacris Horn, 1878, *Trans. American Ent. Soc.*, 7:25, pl. 1, fig. 40. This species has long been considered one of the rarest of North American *Acmaeodera*. It was described from an unique specimen labelled as from Fort Yuma, CALIF. This species has not been collected in the United States since and some believe that the locality was in error. The writer collected a good series of both sexes 3 mi. W. of Tehuantepec, Oaxaca, MEX. July 9-Aug. 2, 1965. Most of the specimens were collected on *Cercidium plurifoliolatum* Micheli but a few were found on *Prosopis juliflora* (Sw.) D. C. The coloration varied from metallic green (as in the type) to bronzy-green and greenish-black. Some reduction of the yellow markings occurs in a few specimens but the markings appear relatively uniform in this series. The males vary in length from 6 to 10.6 mm., in width from 2.2 to 3.4 mm., while the females vary in length from 7.2 to 10.7 mm. and in width from 2.5 to 3.5 mm.

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Buprestis connexa Horn, 1875, Trans. American Ent. Soc., 5:148. In Helfer's 1941 revision of this genus *connexa* was recorded only as far south in California as Yosemite National Park. Before the writer are two specimens from Southern California, one from Big Pines, San Gabriel Mts., Los Angeles Co., July 27, 1962 and the other from the Santa Ana River Gorge, San Bernardino Mts., July 3, 1964, J. A. Robertson.

Poecilonota salicis Chamberlin, 1925, Pan-Pacific Ent., 1:186. One specimen was taken by E. L. Sleeper 13 mi. S. of San Matias Pass (first record for Baja Calif. N., MEX.).

Chrysobothris helferi Fisher, 1942, United States Dept. Agric. Misc. Publ., No. 470:92, 93, figs. 32 and 115c. Two males collected by E. L. Sleeper in Baja Calif. N., one 48 mi. S.E. of Ensenada and the other 13 mi. S. of San Matias Pass are first records for Baja Calif. N., MEX.

Chrysobothris chalcophoroides Horn, 1886, Trans. American Ent. Soc., 13:109, 110-111, pl. 6, figs. 203-206. This species was described from an unique female from "Arizona." At the time of his revision Fisher (1942) had only three female specimens for examination and the male was unknown. During the past several years the writer has taken 3 females and 4 males all on *Quercus arizonica* Sargent. One of the latter was compared with the female holotype in the Academy of Natural Sciences of Philadelphia and is described here.

Description of male.—Form as female but differs as follows: slightly less robust; last visible sternum (fig. 2) with triangular smooth area at base, apex deeply, arcuately emarginate, angles strongly produced and obliquely truncate; anterior tibia with elongate dilation at apex (fig. 4) and brush of stiff hairs on inner side of dilation.

Length: 20.0 mm. Width: 8.2 mm.

Genitalia (fig. 3).

Plesiallotype in the writer's collection from ARIZ., Santa Rita Mts., Madera Canyon, July 30, 1963, G. H. Nelson, on *Quercus Arizonica* Sargent.

The four males vary in size from 18.0 to 22.0 mm. in length and from 7.7 to 9.0 mm. in width; the three females from 21.0 to 22.0 mm. in length and from 8.7 to 9.5 mm. in width.

Chrysobothris wickhami Fisher, 1942, United States Dept. Agric. Misc. Publ. No. 470:209, 210, fig. 88. Three females were the only specimens before Fisher when he described this species. During the past several years a short series of both sexes has been collected in Imperial Co., CALIF., on *Prosopis juliflora* (Sw.) D. C. A male, which compared favorably with the type, is described here.

Description of male.—Differs from female as follows: less robust; last visible sternum (fig. 8) with midline shallowly concave (carinate in female) and apex deeply, arcuately emarginate, angles produced and obliquely truncate; anterior tibia with row of small teeth on inner margin and brush of stiff hairs near apex (fig. 6), middle tibia arcuate.

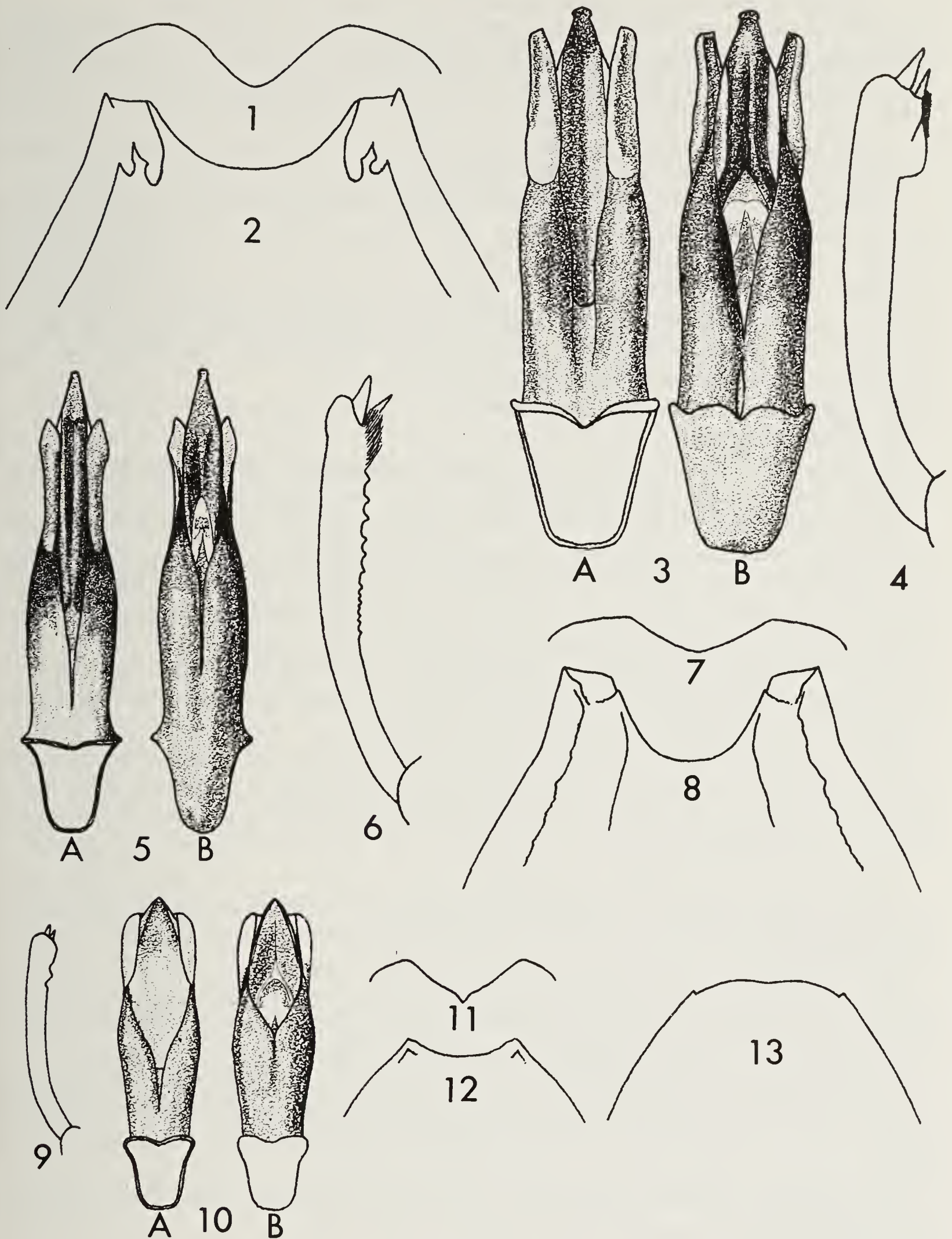
Length: 15.8 mm. Width: 6.2 mm.

Genitalia (fig. 5).

Plesiallotype in the writer's collection from CALIF., 8 mi. E. of Holtville, June 24, 1958, G. H. Nelson, collected on *Prosopis juliflora* (Sw.) D. C.

Two males are very similar including size; five females vary in length from 18.5 to 21.5 mm. and in width from 7 to 8 mm.

Chrysobothris prasina Horn, 1886, Trans. American Ent. Soc., 13:116, 118,



FIGURES 1-4, *Chrysobothris chalcophoroides* Horn (male); 1—clypeus; 2—last visible sternite; 3—male genitalia, A—dorsal view, B—ventral view; 4—protibia.

FIGURES 5-8, *Chrysobothris wickhami* Fisher (male); 5—male genitalia, A—dorsal view, B—ventral view; 6—protibia; 7—clypeus; 8—last visible sternite.

FIGURES 9-12, *Chrysobothris prasina* Horn (male); 9—protibia; 10—male genitalia, A—dorsal view, B—ventral view; 11—clypeus; 12—last visible sternite.

FIGURE 13, *Chrysobothris b. biramosa* (Fisher), last visible sternite, female.

pl. 7, figs. 244-247. This is another species described from a unique female. Specimens have been collected from the following localities: CALIF., San Diego Co., Riverside Co., San Bernardino Co., Los Angeles Co., Kern Co.; ARIZ., Coconino Co., Navajo Co. Two specimens from Palm Desert, Riverside Co. were collected on *Dalea spinosa* Gray and the rest were taken on *Ephedra*.

The male described here was compared with the female holotype in the Academy of Natural Sciences of Philadelphia.

Description of male.—Differs from female as follows: front of head golden green with cupreous tint and vertex with cupreous chevron; anterior pronotal angles cupreous; antennae golden-cupreous on basal two segments, darker cupreous distally; inner surface of profemora cupreous and outer surface of mesofemora with aeneous tint; protibia with small blunt tooth near apex (fig. 9), metatibia with row of small teeth on inner margin; last visible abdominal sternite shallowly, arcuately emarginate (fig. 12).

Length: 7 mm. Width: 2.75 mm.

Genitalia (fig. 10).

Plesiallotype in the writer's collection from CALIF., San Diego Co., 5 mi. E. of Jacumba, June 19, 1960, G. H. Nelson, on *Ephedra californica* S. Wats.

In the series at hand violaceous tints appear on the upper surface in some specimens of both sexes and an occasional specimen has an elongate postmedian violaceous to black spot on each elytron and this may be represented by two smaller spots. One male from near Winslow, ARIZ. has a violaceous pronotum and elytra that are blue with violaceous tints toward the apex.

Chrysobothris biramosa biramosa (Fisher), 1935, Proc. Ent. Soc. Washington 37:117-118. This species was described from an unique male. The female described here compared favorably with the type.

Description of female.—Differs from male as follows: general form more robust; antennae serrate (not biramose), gradually narrowed toward apex, third segment about as long as next three segments combined; apex of last ventral sternum rounded (fig. 13).

Length: 11.5 mm. Width: 4.5 mm.

Plesiallotype, writer's collection from UTAH, Tooele Co., Skull Valley (type locality), July 16, 1962, G. H. Nelson and Family, collected on *Atriplex confertifolia* S. Wats.

The males vary in length from 7.5 to 10 mm., in width from 3 to 4 mm.; the females from 10 to 11.5 mm. in length, and from 4 to 4.5 mm. in width. For other notes on variation and distribution see Nelson (1966).

Agrius obtusus Horn, 1891, Trans. American Ent. Soc., 18:288. This species has been known by only the male sex. A female that has been compared with the male type in the Academy of Natural Sciences of Philadelphia is made known here.

Description of female.—Slightly more robust than the male but otherwise alike externally.

Length: 9.5 mm. Width: 2.92 mm.

Female plesiallotype in the writer's collection from N. MEX., Whites City, July 19, 1959, D. G. Kissinger, on *Cassia* sp.

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MUTUALISTIC CLEANING BEHAVIOR IN AN AQUATIC BEETLE¹ (COLEOPTERA)

By GEORGE W. FOLKERTS

Interspecific relationships between animals in which one animal cleans the other, or removes parasites or excises injured or diseased portions from its body are known among various groups of organisms. Among vertebrates, often mentioned is the relationship between the African tick birds (*Buphagus* spp.) and numerous ungulates, notably the African buffaloes (*Syncerus* spp.) and certain rhinoceroses. Among the fishes, well known relationships exist between many of the smaller wrasses (Labridae) and a host of other marine organisms, the wrasses always being the cleaners.

In the invertebrate groups, many instances of mutualism are known, although few of these involve cleaner-client relationships. In the Crustacea, one or possibly several species of red or cleaner shrimps (*Hippolytina* spp.) clean and service species of marine fishes, especially the morays (Muraenidae). In the insects, as far as the writer has been able to ascertain, there have been no definite relationships of this type noted. Some ornithologists have theorized that the anting behavior of birds, in which the birds pick up ants and place them among the feathers, is a relationship of this type. Supposedly, the insects crawl about among the feathers and kill or remove ectoparasites.

During a recent survey of the Hydradephaga of Alabama the writer had occasion to keep living specimens of several species of these aquatic beetles in captivity. One of these, a large dytiscid, *Cybister fimbriolatus* (Say), was placed in a 100 gallon aquarium for observation. Living with it in this tank was a large aquatic salamander, *Amphiuma means* (Garden), commonly called the congo eel. The amphibian had been in captivity for several years and had continually been plagued with a fungus which created lesions on the body and caused a two inch section of the tip of the tail to shrivel and become useless.

Several days after the beetle was introduced into the tank, it was noticed hovering in the vicinity of the salamander. Closer examination revealed that it was chewing on the fungus-ridden tail of the amphibian and feeding on the fungus and damaged flesh. The salamander remained motionless, resting on the bottom languidly, even though some apparently living tissue was being excised by the beetle. After about 20 minutes of this type of activity the beetle ceased feeding and swam slowly to the other end of the tank. Two days later the writer again noticed behavior of this type and it was evident that considerable quantities of

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